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SHEEP RANGE SUITABILITY GUIDES FOR THE GRANITIC SOILS OF IDAHO

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SHEEP RANGE SUITABILITY GUIDES FOR THE GRANITIC SOILS OF THE IDAHO BATHOLITH REGION

The Idaho Batholith is an intruded mass of igneous rock about 250 miles long and 90 miles wide encompassing approximately 16,000 square miles and extending from Elmore County in southwestern Idaho through central Idaho into Montana. Steep, rough topography is the dominant feature of the Idaho Batholith Region (Figure 1). Elevation varies from nearly 11,000 feet on the higher peaks of the south to around 2,000 feet on the Salmon River at the western edge of the Batholith. The higher regions have been extensively glaciated and are characterized by U-shaped canyons heading in steep-walled cirques. At lower elevations the canyons are V-shaped, generally very deep and have long, smooth slopes.

Quartz monzonite is probably the dominant rock of the Batholith. This rock disintegrates readily, forming coarse, gravelly, sandy loam or loamy sand soils. The average composition of these soils runs at about 80 percent sand and gravel, 10 to 15 percent silt, 5 to 10 percent clay, and 2 to 5 percent organic matter. Soils are relatively light in color and generally show little profile development. Structure is weak or very weak and ranges from granular to subangular blocky. Depth to bedrock varies widely but in general it is shallow to moderately deep on south and west exposures, moderately deep to deep on east exposures, and deep to very deep in canyon bottoms and on glacial moraine deposits.

True granite, granodiorite, and quartz diorite also occur in the Batholith but are rather limited in extent. Bodies of rhyolitic, basaltic, and metamorphosed sedimentary rocks are found along the border zones of the Batholith. These rocks generally form finer textured soils than those derived from quartz monzonite.

The major vegetative types are conifer timber, grass, sagebrush, and mountain brush (Figure 2). Present but less extensive in area are meadow, broadleaf tree, and forb types. The conifer timber type is characteristic of slopes having north and east exposures; the grass and sagebrush types are commonly found on south and west exposures; and the mountain brush type occurs on east or north exposures.

Climate in the Idaho Batholith Region is highly variable because of the wide elevation range; however, the general pattern is one of short, rather

hot summers, and long cold winters. Precipitation ranges from less than 12 inches at some of the lower elevations to more than 30 inches in the higher mountains. Most of the precipitation occurs as snow from October through March. The driest months of the year are July and August when average precipitation rarely exceeds one inch per month even at the higher elevations, but high intensity storms of short duration are common throughout the summer months.

Figure 1 - Steep, rough topography is the dominant feature of the Idaho Batholith Region.

Figure 2 - Conifer timber, grass, and sagebrush are the major vegetative types in the Idaho Batholith Region.

SUITABILITY DETERMINATION

The Idaho Batholith Region has long been an important summer range for thousands of sheep. Until recently, little effort has been made to determine how much of this range is suitable for livestock grazing. Sheep have been grazed on extremely steep slopes and on many areas having shallow soils and sparse plant cover. This has been done even though grazing on such areas has resulted in serious watershed damage. If watershed stability is to be attained, only those areas that can be grazed without damage to the plant cover or to the soil mantles can be classed as suitable range.

Many factors must be considered in determining suitability on the granitic soils of the Idaho Batholith Region. These have been stressed in research carried out on granitic soils by Craddock and Pearse (1), Renner (2), and Packer (3). The major factors are as follows:

Productivity and Accessibility

Forage-producing areas permanently inaccessible to livestock, or accessible areas producing less than 50 pounds of natural forage per acre, dry weight, should not be considered as range since it is either impossible or economically unfeasible to graze such areas. Productive sites which are accessible may be classed as suitable range provided other limiting factors are not involved.

Soil Depth

Other factors being constant, herbage production normally increases with increased soil depth. Thus, the chances of having adequate ground cover and stable soil are much greater on deep soils. The fact that shallow soils are less stable than deep soils was shown by Renner in his studies. He found accelerated erosion occurred on only 30 percent of the areas having mantles 1 to 2 1/2 feet deep, but on 75 percent of the areas with mantles less than 1 foot in depth.

Ground Cover

Ground cover is the most important factor that must be considered in determining range suitability. The granitic soils of the Idaho Batholith Region are relatively stable when undisturbed (Figure 3), but are subject to trampling displacement and/or rapid erosion when protective plant cover is reduced (Figure 4).

Several researchers have demonstrated the importance of vegetation and litter in controlling runoff and erosion on granitic soils. Craddock and Pearse found an undisturbed wheatgrass type having a 35 percent plant density 1/ yielded practically no runoff or erosion, while an annual weed type having a 5 percent plant density yielded 64.35 percent runoff and produced 8.79 tons per acre of eroded material from 1.8 inches of artificial rainfall applied during a 30-minute period.

Renner found a plant density 2/ of less than 30 percent had little effect in retarding erosion; but as density increased above 30 percent, erosion decreased rapidly. A cover of 40 percent was sufficient to prevent gully erosion and practically no erosion occurred under a 75 percent plant density. His studies also showed the importance of litter in controlling erosion. Litter cover was most lacking in those vegetative types where erosion was the greatest. The quantity of litter and humus found on each of the eight vegetative types studied corresponded closely to the order in which they were eroded. The weed (forb) type, which was the most seriously eroded, had 55 percent of its areas lacking in litter, while on the nongrazing type, which showed the least erosion, only 35 percent of the areas was lacking in litter.

Packer's studies showed total ground cover 3/ and size of openings were the two site characteristics which dominately affect runoff and erosion. Ground cover exercised the greatest control over runoff and size of opening was the major factor in controlling erosion. He concluded that a ground cover of at least 70 percent and bare soil openings of not more than 4 inches were needed to control runoff and erosion on a wheatgrass type. On a cheatgrass type the same ground cover requirement was necessary, but 2 inches was the maximum limit for bare soil openings.

1/ Plant density = plant basal area.
2/ Plant density = the area of the plant canopy projected on the ground.
3/ Ground cover = plant basal area plus litter.

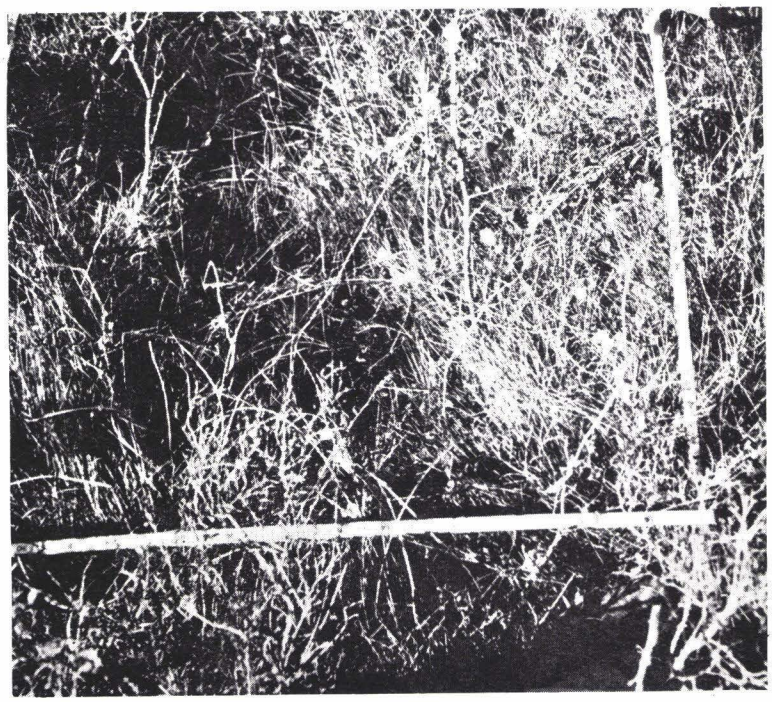

Figure 3 - Complete soil stability under good plant cover. Cover provided by vegetation and litter is most often the limiting factor in determining range suitability.

Figure 4 - Extensive rill erosion on a site having a 65 percent slope and 20 percent ground cover provided by vegetation and litter.

Ground Cover Dispersal

The manner in which vegetation and litter is dispersed over the soil surface is also an important factor in determining runoff and erosion. Ellison and Croft (5) found a high degree of dispersion was a characteristic of normal cover, and that such dispersion was as important in providing effective soil protection as a large amount of cover. They showed that a well dispersed cover of poor-quality vegetation was much more efficient in holding soils than was patchy vegetation that gave only localized protection.

Figures 5 and 6 illustrate ground cover dispersal. Figure 5 shows well dispersed cover on a site having a total ground cover of 30 percent, while Figure 6 shows poorly dispersed cover on a site having a total cover of 20 percent.

Slope

Slope is of little significance in determining suitability where ground cover exceeds minimum protection requirements, but it must receive major consideration on sites where ground cover is inadequate to hold the soil. Runoff and erosion increase with increased slope where ground cover is such that water can collect and run over the soil surface (Figure 4). This relationship between slope and ground cover is demonstrated in the studies conducted by Craddock and Pearse. They found a 10 percent increase in a slope on an annual weed type having a 5 percent plant density resulted in a 10 percent increase in runoff and an increase in soil loss of nearly 10 1/2 tons per acre. On an undisturbed wheatgrass type with a plant density of 35 percent, water and soil losses were negligible regardless of slope.

Renner's studies showed that erosion increased consistently with increased gradient up to about 35 percent. On slopes steeper than 35 percent, the degree of erosion did not increase, and above 65 percent, erosion was actually less serious. Renner attributed this complete reversal of the normal trend toward increased erosion with increased slope to variation in accessibility. He pointed out that the steeper slopes were generally less accessible to livestock than were the gentler slopes and, therefore, received less grazing pressure. On areas fully accessible to livestock, he found erosion was progressively worse with increase in gradient.

Packer found slope gradient had no significant effect on runoff or erosion; however, the plots used in the study were only 6 feet long, and

Packer noted that tests on longer slopes might show slope gradient to be more important than was indicated by his studies.

Figure 5 - Uniform ground cover dispersal on a site with 30 percent total cover. A well dispersed vegetal cover holds the size of bare soil openings to a minimum. This provides better protection for the soil than does clumpy vegetation where large bare soil openings prevail (see Figure 6).

Figure 6 - Poorly distributed vegetation as indicated by the large bare soil openings alternating with clumps of vegetation. Ground cover 20 percent, slope 50 percent.

Aspect

Slopes having southerly exposures often show advanced soil and plant depletion. The close correlation between aspect and erosion was indicated in the studies conducted by Renner. He found areas facing the south were in the most serious condition, with four-fifths of all such areas being eroded. Erosion gradually decreased with change in exposure from south through north, where it was only half as prevalent as on south exposures. The severe erosion commonly found on south exposures is due to heavy grazing pressure plus several adverse site factors, the most important of which are shallow soils, extremely high soil temperatures, and long periods of drouth during the summer months. Heavy grazing pressure has occurred on south exposures largely because of their ready accessibility of livestock. The close correlation between aspect and accessibility was shown in Renner's studies, which showed south exposures were 82 percent accessible as compared to 62 percent for north exposures. Because of the harsh site, recovery on south exposures is very slow (Figure 7). It is highly probable that grazing in any degree will preclude improvement in plant cover on many of these slopes.

Figure 7 - Recovery is extremely slow on south exposures. This area has been closed to grazing for more than 40 years. Ground cover is still only 50 percent. This is probably near the maximum cover the site can be expected to support.

SUITABILITY GUIDES

The ultimate management objective for the ranges of the Idaho Batholith Region is to improve all range to the point where watershed stability is attained. Determining which areas can, and which areas cannot be safely grazed is a major step in reaching this objective. The suitability guides presented here were designed to aid range managers and technicians in making these determinations. The guides are based on plant productivity, soil depth, ground cover, slope, and ground cover dispersal. Other factors, such as aspect, are indirectly involved. Ground cover and slope are given the most emphasis because research indicates the prime importance of these factors in controlling runoff and erosion. The guides are based on data obtained from the following sources:

1. Research conducted by Intermountain Forest and Range Experiment Station.

2. Administrative studies conducted by R-4 range technicians and soil scientists.

3. Range allotment analysis data.

4. On-the-ground personal observations and field checks made by Region 4 range technician.

The guides do not adhere rigidly to the minimum watershed protection standards developed by Packer because the role of slope in affecting runoff and erosion is not recognized in his standards. Packer's minimum ground cover requirements are followed for the steeper slopes, but it is believed that as the slope becomes less steep, grazing can be allowed on areas with less than minimum ground cover requirements. While such areas admittedly are not in satisfactory watershed condition, with proper stocking and good management they can generally be improved to the point where watershed stability is attained. Because of the many factors governing range suitability, it is difficult to devise suitability standards which are applicable to all situations. Therefore, it is not intended that the suitability key outlined herein will apply to all areas. The intent is to provide guides which will aid range managers and technicians to do a more realistic and uniform job of suitability classification.

SUITABILITY KEY
FOR SHEEP RANGES ON GRANITIC SOIL

1. Natural forage production less than 50 lbs./A. dry weight 7 or 8 (Barren)

1. Natural forage production exceeds 50 lbs./A. dry weight

    2. Effective soil depth less than 10 inches

        Range used - Unsuitable - U
        Range not used - Unsuitable - N

    2. Effective soil depth exceeds 10 inches

        3. Ground cover exceeds 70 percent 1/

            4. Slope exceeds 65 percent

                Range used - Unsuitable - U
                Range not used - Unsuitable - N

            4. Slope less than 65 percent

                Range used - Primary - S
                Range not used - Secondary - (S)

        3. Ground cover between 61 and 70 percent

            5. Slope exceeds 45 percent

                Range used - Unsuitable - U
                Range not used - Unsuitable - N

            5. Slope less than 45 percent

                Range used - Primary - S
                Range not used - Secondary - (S)

        3. Ground cover between 41 and 60 percent

            6. Slope exceeds 45 percent

                Range used - Unsuitable - U
                Range not used - Unsuitable - N

            6. Slope between 26 and 45 percent

1/ Ground cover = basal area of plants plus litter.

7. Cover dispersal rating uniform or fairly uniform
   Range used - Primary - S
   Range not used - Secondary - (S)

7. Cover dispersal rating variable or highly variable
   Range used - Unsuitable - U
   Range not used - Unsuitable - N

6. Slope less than 25 percent
   Range used - Primary - S
   Range not used - Secondary - (S)

3. Ground cover less than 40 percent

8. Slope exceeds 25 percent
   Range used - Unsuitable - U
   Range not used - Unsuitable - N

8. Slope less than 25 percent

9. Site amenable to rehabilitation*
   Suitable - S

9. Site not amenable to rehabilitation
   Unsuitable - U

*A site amenable to rehabilitation is one having a forage productive potential and which is suitable for grazing in all respects except that it is either not producing to full potential or is producing mostly invader species. For example, depleted sagebrush types on relatively level terrain and having deep soil mantles would be considered amenable since rehabilitation could be accomplished through reseeding or by spraying with herbicides. Another example would be sites that could be restored through improved management.

NATURAL FORAGE PRODUCTION
LESS THAN 50 POUNDS PER ACRE DRY WEIGHT

If devoid of all vegetation, these sites should be classed as TYPE 8 - BARREN. If production is less than 50 pounds per acre dry weight, classify as TYPE 7.

Figure 8 - Barren areas most commonly occur at the higher elevations and are often the result of extensive glaciation. Classed as TYPE 8 - BARREN.

Figure 9 - Dense stands of timber produce but little forage and are generally inaccessible to sheep because of down timber. Classed as TYPE 7.

Figure 10 - Closeup of heavily timbered area. Producing very little forage and inaccessible because of down timber. Classed as TYPE 7.

FORAGE PRODUCTION EXCEEDS 50 POUNDS PER ACRE DRY WEIGHT
EFFECTIVE SOIL DEPTH LESS THAN 10 INCHES
RANGE USED - Classify as UNSUITABLE USED - U
RANGE NOT USED - Classify as UNSUITABLE NOT USED - N

These sites are often found on steep south slopes. Ledges or rock outcrops on or near the site are good indicators of the shallow soil. Such sites are inherently unstable and will not withstand grazing in any degree.

Figure 11 - Production of decreaser and increaser species on this site was approximately 150 pounds per acre. Soil depth 10 inches.
Classed as UNSUITABLE USED - U.

EFFECTIVE SOIL DEPTH EXCEEDS 10 INCHES
GROUND COVER EXCEEDS 70 PERCENT
SLOPE EXCEEDS 65 PERCENT
RANGE USED - Classify as UNSUITABLE USED - U
RANGE NOT USED - Classify as UNSUITABLE NOT USED - N

These are slopes at or above the angle of repose for granitic soils and the lightest of use, even in combination with maximum ground cover, will probably result in site deterioration.

No Photograph

GROUND COVER EXCEEDS 70 PERCENT
SLOPE LESS THAN 65 PERCENT
RANGE PROPERLY GRAZED
USED - Classify as PRIMARY - S
NOT USED - Classify as SECONDARY - (S)

Common site characteristics:

Aspect	:	Generally northwest through northeast.
Type	:	Mountain brush or grass openings in conifer timber types. Generally medium to high elevation areas.
Production	:	High. Generally exceeds 1,200 pounds per acre dry weight.
Soil depth	:	Deep to very deep.

Factors limiting grazing:

Small acreage involved and often borderline as to accessibility. Steep slopes preclude anything but once-over light use. Utilization on the three most heavily used species in the stand should not exceed 20 percent and trampling disturbance should not exceed 10 percent.

Figure 12 - Slope 60 percent, ground cover 90 percent. Mountain brush type with elk sedge understory. Site in near excellent condition. Classed as S5 if used or (S) 5 if not used.

Figure 13 - Mountain brush type on 37 percent slope with 78 percent ground cover. Classed as S5 if used or Ⓢ 5 if not used.

Figure 14 - Sagebrush type on 26 percent slope with 76 percent ground cover. Classed as S4 if used or Ⓢ 4 if not used.

Figure 15 - Elk sedge type on 43 percent slope with 79 percent ground cover. Classed as S1 if used or Ⓢ 1 if not used.

GROUND COVER BETWEEN 61 and 70 PERCENT
SLOPE EXCEEDS 45 PERCENT
RANGE USED - Classify as UNSUITABLE USED - U
RANGE NOT USED - Classify as UNSUITABLE NOT USED - N

Sites with near 70 percent ground cover and with slopes near 45 percent may be borderline as to suitability. On sites where ground cover is near the lower edge of the class, size of opening is generally such that the vegetation has inadequate control of the site.

Figure 16 - Site with 62 percent ground cover and 57 percent slope. Note large size of bare soil openings and evident down-slope movement of surface gravel. Classed as U5 if used or N5 if not used.

GROUND COVER BETWEEN 61 and 70 PERCENT
SLOPE LESS THAN 45 PERCENT
RANGE PROPERLY GRAZED
USED - Classify as PRIMARY - S
NOT USED - Classify as SECONDARY - Ⓢ

Common site characteristics:

Aspect	:	Variable but most often northeast through southeast.
Type	:	Generally grass, mountain brush, or sagebrush.
Production	:	Fairly high. Generally exceeds 1,000 pounds per acre dry weight.
Soil depth	:	Medium to deep.

Factors limiting grazing:

These sites receive moderate to heavy use. Vegetative condition will generally rate fair or better. Utilization on the three most heavily used species in the stand should not exceed 20 percent and trampling disturbance should not exceed 10 percent.

Figure 17 - Wheatgrass-elk sedge type with 63 percent ground cover and 37 percent slope. Classed as S1 if used or Ⓢ 1 if not used.

Figure 18 - Mountain brush type on 15 percent slope with 62 percent ground cover. Classed as S5 if used or Ⓢ 5 if not used.

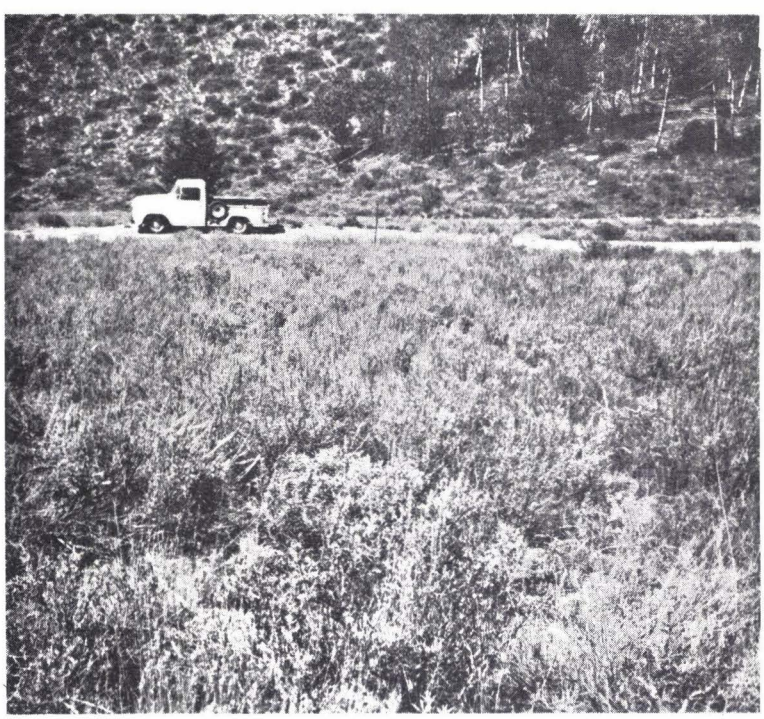

Figure 19 - Sagebrush type on 18 percent slope with 70 percent ground cover. Classed as S4 if used or Ⓢ 4 if not used.

GROUND COVER BETWEEN 41 and 60 PERCENT
SLOPE EXCEEDS 45 PERCENT
RANGE USED - Classify as UNSUITABLE USED - U
RANGE NOT USED - Classify as UNSUITABLE NOT USED - N

Common site characteristics:

Aspect	:	Generally south through southwest.
Type	:	Sagebrush or grass - occasionally high elevation weed.
Production	:	500 to 1,000 pounds per acre dry weight. May exceed 1,500 pounds on weed types.
Soil depth	:	Shallow to medium.

Factors limiting grazing:

These sites are readily accessible to sheep and receive heavy grazing use. Ground cover generally runs between 40 and 50 percent. Recovery on these sites is very slow due to harsh site and advanced soil depletion.

Figure 20 - Site with 41 percent ground cover and 55 percent slope. Classed as U4 if used or N4 if not used.

GROUND COVER BETWEEN 41 and 60 PERCENT
SLOPE BETWEEN 26 and 45 PERCENT
COVER DISPERSAL RATING UNIFORM OR FAIRLY UNIFORM
RANGE PROPERLY GRAZED

USED - Classify as PRIMARY - S
NOT USED - Classify as SECONDARY - (S)

Common site characteristics:

Aspect	:	Generally northeast through northwest.
Type	:	Mountain brush and mid to high elevation grass types generally dominated by elk sedge.
Production	:	Highly variable. As low as 400 pounds per acre dry weight on badly depleted sites to well over 1,000 pounds on less depleted sites having deep soil mantles.
Soil depth	:	Medium to deep.

Factors limiting grazing:

These are sites currently receiving light grazing use. Their position on northerly exposures and at medium to high elevation insures lower soil temperature, more precipitation, and less evaporation loss than do lower elevation southerly exposures. Improvement in production, ground cover, and species composition on these sites can be expected within a reasonable time after grazing pressure has been reduced. Indicators of upward trend are a buildup in litter, and an invasion of bare soil openings by such plants as woollyweed, aster, penstemon, single flowered sunflower, and wheatgrass. Management should provide for once-over use. Trampling disturbance should not exceed 15 percent and utilization on the three species in the stand showing the heaviest use should not exceed 30 percent.

Figure 21 - Slope 30 percent, ground cover 58 percent. Cover dispersal rating uniform. Classed as S4 if used or (S) 4 if not used.

GROUND COVER BETWEEN 41 and 60 PERCENT
SLOPE BETWEEN 26 and 45 PERCENT
COVER DISPERSAL RATING VARIABLE OR HIGHLY VARIABLE
RANGE USED - Classify as UNSUITABLE USED - U
RANGE NOT USED - Classify as UNSUITABLE NOT USED - N

Common site characteristics:

Aspect	:	Southeast through southwest.
Type	:	Sagebrush, grass, and occasionally weed.
Production	:	Highly variable, 500 to more than 1,000 pounds per acre dry weight, depending on soil depth and aspect.
Soil depth	:	Shallow to medium - occasionally deep.

Factors limiting grazing:

These sites are readily accessible to sheep and receive heavy grazing use. Ground cover generally ranges between 40 and 50 percent. Trampling disturbance runs extremely high on the weed and grass types. Depletion is far advanced on most sites and recovery, even under complete closure to grazing, will be very slow.

Figure 22 - Ground cover 42 percent, slope 32 percent. Cover dispersal rating variable. Classed as U4 if used or N4 if not used.

GROUND COVER BETWEEN 41 and 60 PERCENT
SLOPE LESS THAN 25 PERCENT
RANGE PROPERLY GRAZED
USED - Classify as PRIMARY - S
NOT USED - Classify as SECONDARY - (S)

Common site characteristics:

Aspect	:	Variable, but most often southerly.
Type	:	Sagebrush most common.
Production	:	500 to well over 1,000 pounds per acre dry weight; average is around 750 pounds per acre.
Soil depth	:	Moderate to deep, occasionally very deep.

Factors limiting grazing:

These sites comprise most of the suitable range in the Idaho Batholith Region. Ground cover generally averages between 50 and 60 percent. Trampling disturbance should not exceed 30 percent on slopes of 15 percent or less, and should not exceed 20 percent on slopes steeper than 15 percent. Utilization on the three species in the stand showing the heaviest use should not exceed 50 percent on the flatter areas and should not exceed 40 percent on areas having slopes in excess of 15 percent.

Figure 23 - Sagebrush type on 12 percent slope with 55 percent ground cover. Classed as S4 if used or (S) 4 if not used.

GROUND COVER LESS THAN 40 PERCENT
SLOPE EXCEEDS 25 PERCENT
RANGE USED - Classify as UNSUITABLE USED - U
RANGE NOT USED - Classify as UNSUITABLE NOT USED - N

Common site characteristics:

Aspect	:	Southwest through south.
Type	:	Low to mid elevation grass and sagebrush or high elevation weed.
Production	:	Generally ranges between 300 and 700 pounds dry weight.
Soil depth	:	Shallow to medium.

Factors limiting grazing:

These sites receive heavy grazing use and are in poor condition. Southerly exposures and shallow soils make for very slow improvement in condition.

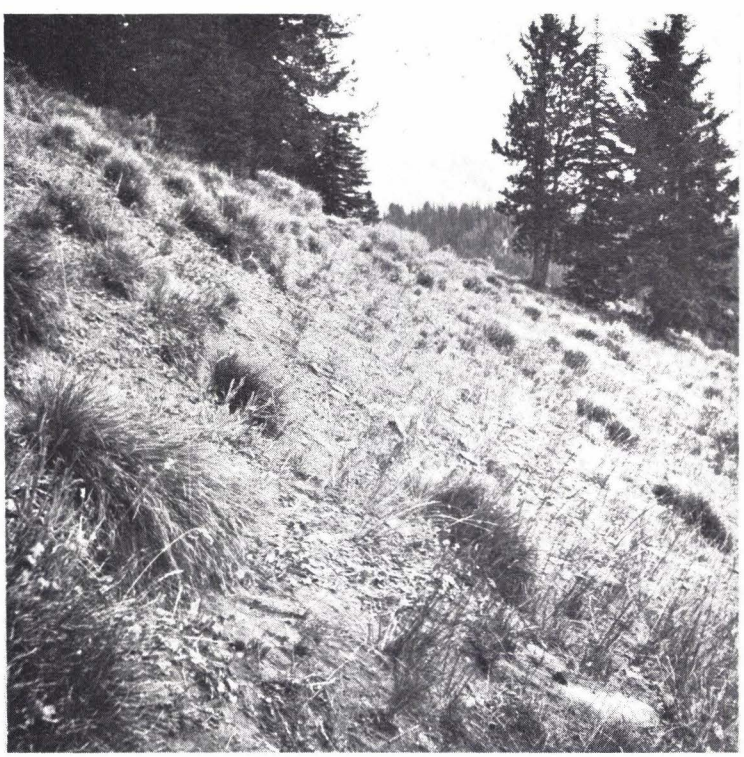

Figure 24 - High elevation grass-forb type dominated by elk sedge. Ground cover 30 percent with 27 percent slope. Classed as U3 if used or N3 if not used.

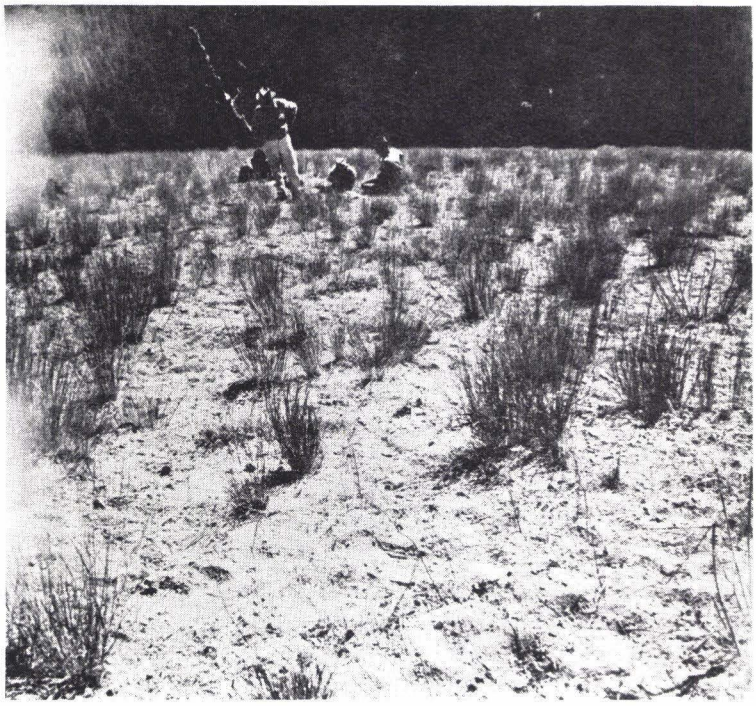

Figure 25 - Grass-weed type on 40 percent slope with 10 percent ground cover. Area supported a good stand of sweet anise before grazing. Classed as U1 if used or N1 if not used.

Figure 26 - Grass-weed type on 40 percent slope with 21 percent ground cover. After grazing, this site looks very much like the site shown in Figure 24. Classed as U1 if used or N1 if not used.

Figure 27 - Sagebrush type on 48 percent slope with 17 percent ground cover. Soil depth 12 inches on 6 inches of fractured bedrock. Classed as U4 if used or N4 if not used.

Figure 28 - Grass type on 65 percent slope with 35 percent ground cover. Area closed to grazing for 20 years. Note excellent vigor of wheatgrass plants. Litter is building up at a very slow rate on this site. Classed as U1 if used or N1 if not used.

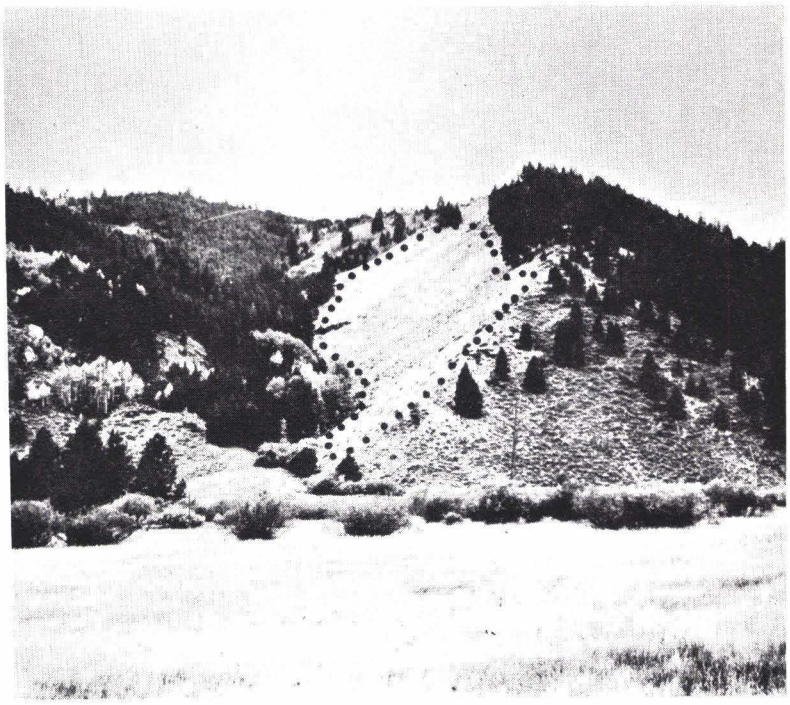

Figure 29 - Steep south slope classed as unsuitable range.

Figure 30 - Closeup of area outlined in Figure 29. Slope 74 percent, ground cover 10 percent. Classed as U1 if used or N1 if not used.

GROUND COVER LESS THAN 40 PERCENT
SLOPE LESS THAN 25 PERCENT
SITE AMENABLE TO ARTIFICIAL REVEGETATION - Classify as SUITABLE - S
SITE NOT AMENABLE TO ARTIFICIAL REVEGETATION - Classify as UNSUITABLE - U

Common site characteristics:

Aspect	:	Southwest through southeast.
Type	:	Low elevation cheatgrass or sagebrush, and high elevation grass and weed.
Production	:	Generally low, ranging from 300 to 600 pounds per acre dry weight, but may exceed 1,000 pounds on deeper soils.
Soil depth	:	Generally medium.

Factors limiting grazing:

These are most often severely depleted sites showing no indication of improvement. Common examples are cheatgrass types on south exposures, sagebrush types with little or no grass or weed understory; high elevation weed types, dominated by pokeweed fleeceflower, and cirque bottoms supporting a sparse stand of weeds. Depletion is generally so far advanced that complete closure to grazing will be necessary unless the site can be stabilized through artificial revegetation.

Figure 31 - Low elevation grass type on a 23 percent slope with 32 percent ground cover. Classed as S1 if amenable to artifical revegetation or U1 if not amenable to artificial revegetation.

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